

4/9 Rudge. (998) cc. 7 5/8" Bore  
 Bore 85 Stroke 88  
 50° V Twin.  
 Cylinder details as for 3 1/2 Rudge.

R.P.M.	4.05	6.9	9.8
500	10	5.8	4.1
1000	20	11.6	8.2
1500	30	17.4	12.3
2000	40	23.2	16.4
2500	50	29.0	20.5
3000	60	34.8	24.6
3500	70	41.4	28.7

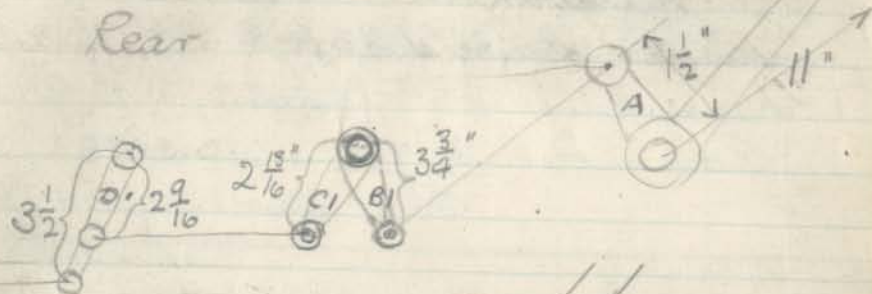
continued

$$\frac{11 \times 3\frac{1}{2} \times 2\frac{2}{10}}{2\frac{1}{2} \times \alpha \times 3\frac{1}{2}} = 5.85$$

$$\alpha = 2.1$$

Austin 20 H.  
 fitted with 4" Type Servo.

Rear



Front



Above leverages are  
 without servo

$$\frac{11}{\frac{1}{2}} = 4.35 \text{ to } 1$$

A increased to  $2\frac{1}{4} = \frac{11}{2\frac{1}{4}} = 4.9 \text{ to } 1$

B1 & C1 is unaltered therefore

D1 must be changed

$$\frac{11 \times 3\frac{1}{2} \times 2\frac{2}{10}}{\frac{1}{2} \times 2\frac{13}{10} \times 3\frac{1}{2}} = 7.2$$

$$\frac{11 \times 3\frac{3}{4} \times x}{2\frac{1}{4} \times 2\frac{13}{10} \times 3\frac{1}{2}} = 7.2 \quad \alpha = 3.85$$

$$\frac{11 \times 3\frac{1}{2} \times 2\frac{2}{10}}{\frac{1}{2} \times 3 \times 3\frac{1}{2}} = 5.85$$

Steering worm & wheel - 7H

Worm 3 STARTS. 10 D.P.

Pitch dia = 1.368"

Real pitch =  $\frac{N}{1.368} = 2.193$

Cos. =  $\frac{2.193}{D.P.}$  = 2.193

Spiral angle = 77° 20'

Wheel. 19 TEETH 10 D.P.

Angle = 12° 40'

Real pitch = 9.7566 x 10

Pitch dia =  $\frac{19}{9.7566} = 1.947$ "

Lead of spiral =  $\frac{\text{circumference}}{\text{tangent}}$

Cos. =  $\frac{\text{Real pitch}}{D.P.}$       D.P. =  $\frac{\text{Real pitch}}{\text{Cos.}}$


Real pitch =  $\frac{N}{P.D.} = D.P. \times \text{Cos.}$

P.D. =  $\frac{N}{\text{Real pitch}} = \frac{N}{D.P. \times \text{Cos.}}$

12H Steering do/ 10 D.P.  $\frac{15}{16}$ "

worm 3 starts P.D. = 1.5898"

Wheel 28 teeth

O.D. = 2.984 

7H Oil Release Valve Spring

Load required 3 LBS.

Free length 1.75"

O.D. = .375" No. of coils 12 20 SWG

$k = \frac{64 \times W \times (R)^3 \times N}{G \times (d)^4}$

$= \frac{64 \times 3 \times (.17)^3 \times 12}{12,000,000 \times (.036)^4} = .562$

Fitted length  $1\frac{3}{16}$ "

(Approved by Spring Makers 14. 11. 24)

Table of Road speeds at 1000 RPM.

WITH VARIOUS GEAR RATIOS

CALCULATED FOR 26" WHEELS.

FOR 28" WHEELS MULTIPLY BY - 1.067

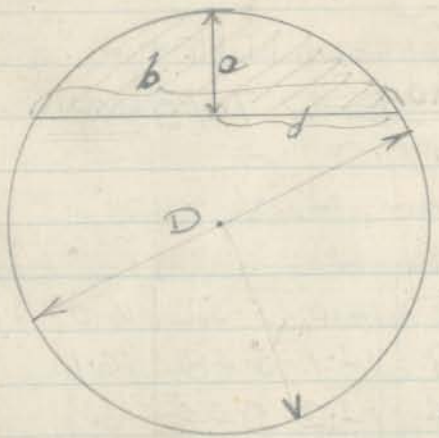
FOR 24" WHEELS MULTIPLY BY - .923

WITH 10 TO 1 GEAR. SPEED IN MPH. =

$$\frac{26 \times \pi \times 60 \times 100}{1760 \times 36} = 7.73 \text{ MPH.}$$

$$1760 \times 36$$

2.0	38.70	4.0	19.33	6.0	12.88	8.0	9.66	10.0	7.73	12.0	6.45	14.0	5.52	16.0	4.83
2.1	36.80	4.1	18.85	6.1	12.67	8.1	9.54	10.1	7.65	12.1	6.39	14.1	5.48	16.1	
2.2	35.10	4.2	18.40	6.2	12.47	8.2	9.42	10.2	7.58	12.2	6.34	14.2	5.44	16.2	
2.3	33.60	4.3	17.98	6.3	12.27	8.3	9.31	10.3	7.50	12.3	6.28	14.3	5.40	16.3	
2.4	32.20	4.4	17.57	6.4	12.07	8.4	9.20	10.4	7.43	12.4	6.23	14.4	5.36	16.4	
2.5	30.92	4.5	17.18	6.5	11.88	8.5	9.10	10.5	7.36	12.5	6.18	14.5	5.33	16.5	4.68
2.6	29.72	4.6	16.80	6.6	11.70	8.6	8.99	10.6	7.29	12.6	6.13	14.6	5.29	16.6	
2.7	28.61	4.7	16.44	6.7	11.52	8.7	8.89	10.7	7.22	12.7	6.08	14.7	5.25	16.7	
2.8	27.60	4.8	16.10	6.8	11.36	8.8	8.79	10.8	7.16	12.8	6.04	14.8	5.22	16.8	
2.9	26.65	4.9	15.77	6.9	11.19	8.9	8.68	10.9	7.09	12.9	5.99	14.9	5.18	16.9	
3.0	25.75	5.0	15.46	7.0	11.02	9.0	8.59	11.0	7.03	13.0	5.95	15.0	5.15	17.0	4.55
3.1	24.95	5.1	15.15	7.1	10.88	9.1	8.50	11.1	6.96	13.1	5.90	15.1	5.12	17.1	
3.2	24.15	5.2	14.85	7.2	10.73	9.2	8.40	11.2	6.90	13.2	5.85	15.2	5.08	17.2	
3.3	23.42	5.3	14.58	7.3	10.58	9.3	8.31	11.3	6.84	13.3	5.81	15.3	5.05	17.3	
3.4	22.73	5.4	14.30	7.4	10.43	9.4	8.23	11.4	6.78	13.4	5.77	15.4	5.02	17.4	
3.5	22.10	5.5	14.05	7.5	10.30	9.5	8.14	11.5	6.72	13.5	5.73	15.5	4.98	17.5	4.42
3.6	21.45	5.6	13.80	7.6	10.16	9.6	8.05	11.6	6.66	13.6	5.68	15.6	4.95	17.6	
3.7	20.90	5.7	13.54	7.7	10.03	9.7	7.87	11.7	6.61	13.7	5.64	15.7	4.92	17.7	
3.8	20.35	5.8	13.32	7.8	9.92	9.8	7.89	11.8	6.55	13.8	5.60	15.8	4.89	17.8	
3.9	19.82	5.9	13.10	7.9	9.79	9.9	7.81	11.9	6.50	13.9	5.56	15.9	4.86	17.9	

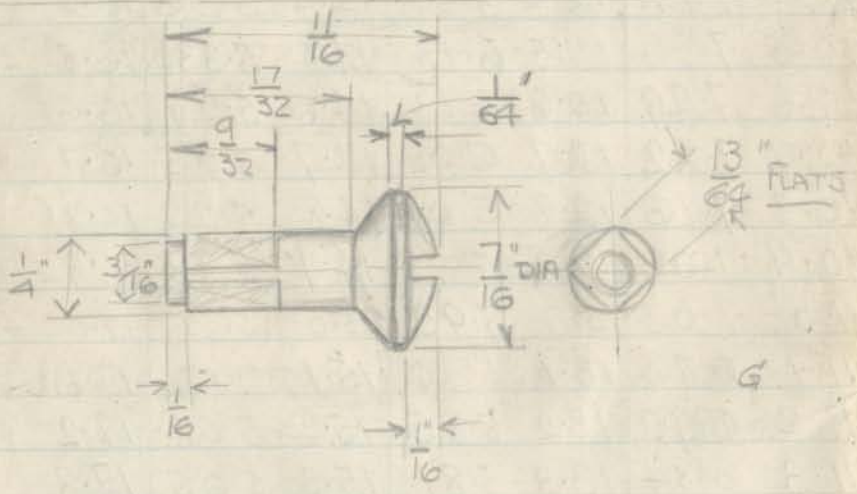


$$a + \frac{b^2}{a} = D$$

$$\text{Area of segment} = \frac{a \times 2 \times b}{3} + \frac{a^3}{2 \times b}$$

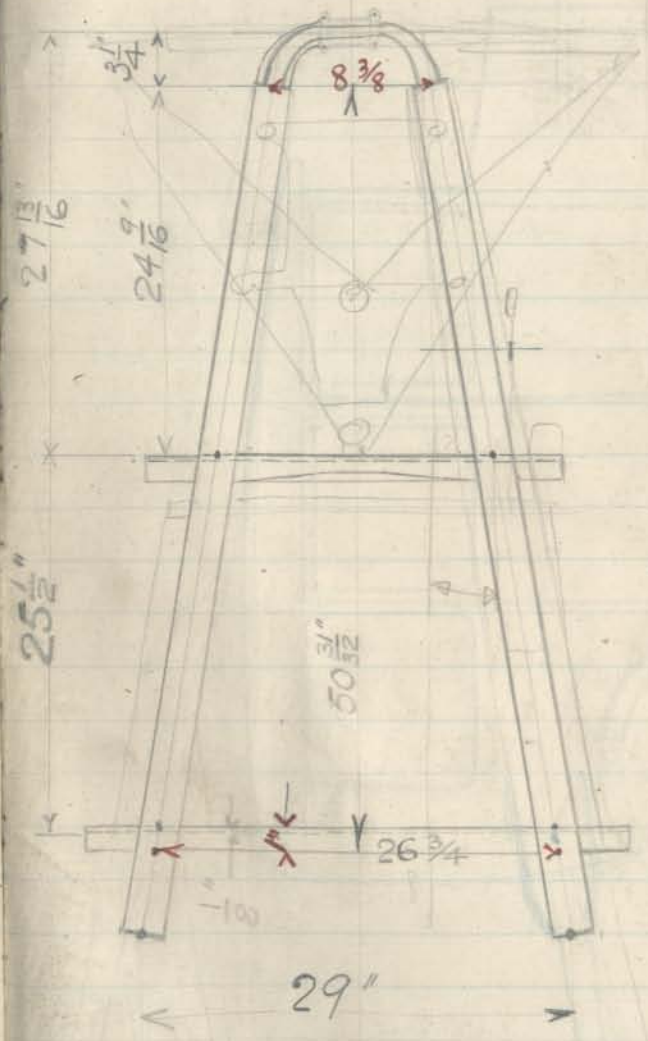
$$= \frac{1 \times 2 \times 2}{3} + \frac{1}{2 \times 2}$$

$$\frac{4}{3} + \frac{1}{4} = \frac{16+3}{12} = \frac{19}{12}$$



Standard nipple for 10 SWG Spokes

4 HP Frame



$$\begin{array}{r} 27.812 \\ 25.5 \\ \hline 53.312 \\ 54.7 \\ \hline 50.312 \end{array}$$

$$\begin{array}{r} 13.375 \\ 4.1575 \\ \hline 9.1875 \end{array}$$

$$\begin{array}{r} 24.5625 \times 9.1875 \\ \hline 50.96875 \end{array}$$

= 4 2/3

